

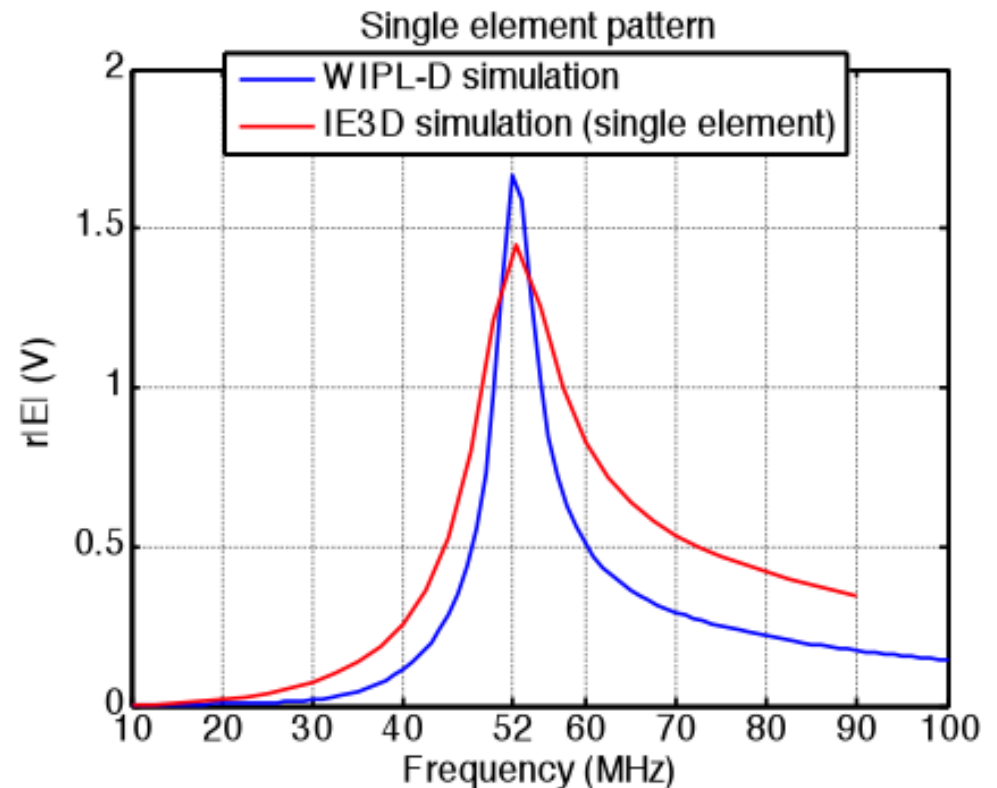
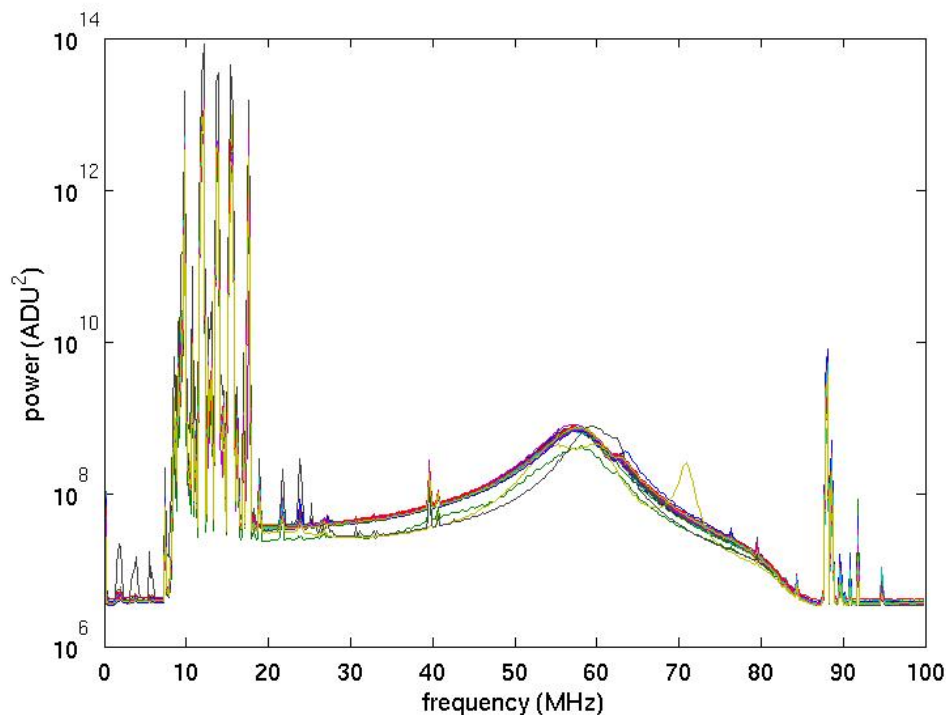
EM-modeling of LBA Response

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LOFAR Status Meeting
Dwingeloo (NL), 27 June 2012

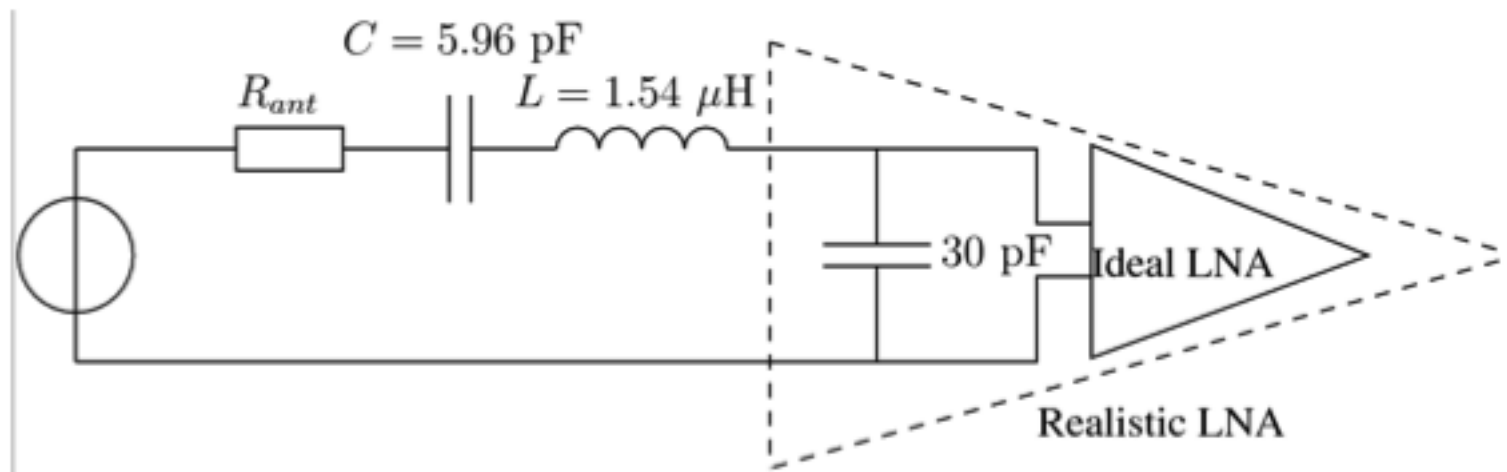
Problem statement

- Measurements: LBA resonance frequency ~ 57 MHz
- Simulations: LBA resonance frequency ~ 52 MHz
- How can we explain these differences?



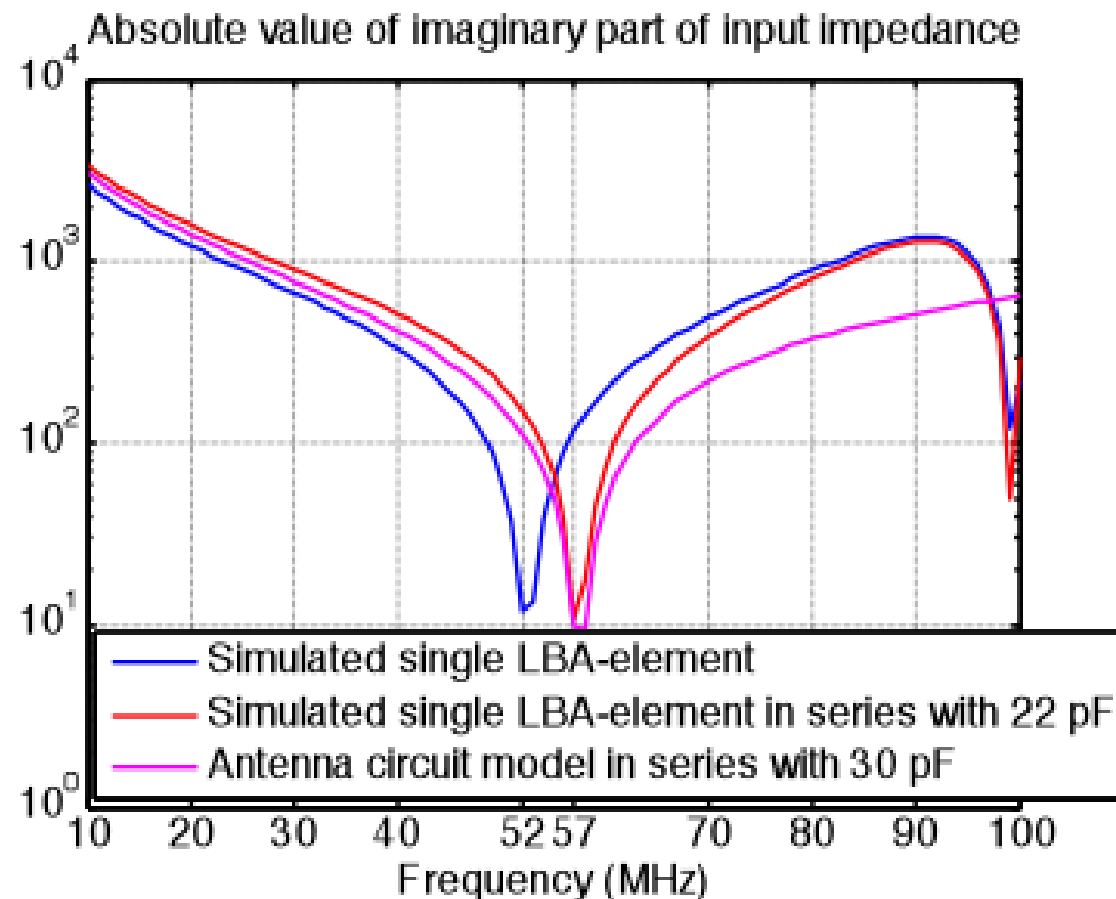
Analysis using equivalent circuit

- $\nu_0 = (2\pi)^{-1}(LC)^{-1/2} = 52.6 \text{ MHz}$
- An ideal LNA has $Z = \infty$
- Our LNA may have capacitance between its input ports (either LNA itself or due to lightning protectors)
- capacitance of 30 pF shifts ν_0 from 52 to 57 MHz



Comparison with WIPL-D result

- WIPL-D: 22 pF sufficient to move ν_0 from 52 to 57 MHz
- Equivalent circuit: 30 pF required



- Freq. shift can be explained by 22 or 30 pF capacitance (depending on model)
- Possible causes
 - non-ideal LNA
 - lightning protectors

Next steps

- EM-sims of LBA + LNA
- full station EM-simulations (incl. mutual coupling)

